

quite different from those of the larva or the rudimentary jaws of the perfect insect. These are to enable the pupa to cut its way through the cocoon and outer case, when it is ready to assume the perfect state. It then becomes active, swimming by means of its two middle legs, the tarsi of which are densely fringed with long ciliæ, forming admirable oars. By means of these the pupa reaches the stem of some aquatic plant, up which it creeps out of the water, and then sheds its pupa-skin, and lives a short aerial life which seems wholly devoted to the duty of continuing the species.

From the foregoing brief sketch of the main features of this order of insects, it will be seen that they form what is probably a very ancient group, which has preserved some of the characteristics of several distinct orders. Though, owing to the structure of the rudimentary mouth, the Trichoptera have to be classed among the mandibulate or gnawing insects, and are supposed to be allied to both the Neuroptera and the lower Hymenoptera, yet in the neuration of the wings, their hairy clothing, the silk-spinning and case-bearing larvæ, and the form and habits of the perfect insect, they more nearly resemble some of the smaller moths, with which Mr. McLachlan believes they have a real affinity. So, in the curious activity of an otherwise quiescent pupa, which possesses special organs for gnawing and for swimming, these insects seem intermediate between the groups with an imperfect and those with a perfect metamorphosis, though far more closely allied to the latter; and owing to these various peculiarities the Trichoptera may be said to constitute a "critical" group, whose study cannot fail to throw light on the affinities and genealogy of insects generally. Owing however to their obscure colours and slightly varied forms they have attracted comparatively little attention, though a few ardent workers have for many years devoted themselves to this branch of entomology; but the appearance of the present elaborate work, which is a model of conscientious labour and research, will form an important era in the study of the group.

This large and handsome octavo volume is devoted to a complete description of all the species of Trichoptera which have been discovered in Europe and Northern Asia, or in what is now termed the Palearctic Region. These descriptions have all been drawn up from specimens of the insects themselves—often of the greatest rarity—and the fact that the 'chief museums and private cabinets of Europe and America have placed their collections in Mr. McLachlan's hands for the purposes of this work, is the best proof of the high reputation he has attained as a master in this branch of entomology. The book is illustrated by fifty-nine plates containing about 2,000 distinct figures (all drawn by the author himself), illustrating generic and specific characters mostly derived from the neuration of the wings and the structure of the anal appendages. These latter organs are wonderfully varied from species to species while constant in each; and by carefully delineating them by means of the *camera lucida*, species have been shown to be distinct which appear in all other respects to be identical; and the fact of such distinctness in a considerable number of cases is one of the most curious and interesting results of Mr. McLachlan's researches.

The work has occupied nearly six years in its publica-

tion, and it has had the effect of stimulating inquiry to such an extent that a large number of new species have been discovered during its progress, rendering the book half as large again as was anticipated; yet the author believes that a comparatively small portion only of the European species are yet known, while in less familiar regions there is a wide field for the discovery of new and remarkable forms. There remain also a number of larvæ which have not been identified with the perfect insect, and an interesting and useful line of observation is thus open to entomologists both at home and abroad. Under these circumstances every naturalist will appreciate the value of a work which has collected together and thoroughly worked up all the material available to the latest date. Such a book cannot, from its nature, be a popular one. Its production has been a labour of love, and is to that extent its own reward; but the expense of producing such a volume is very great, and in order to encourage and even to render possible the production of such works it becomes the duty of all who wish to advance the study of nature to do what in them lies to relieve such enthusiastic workers from the pecuniary burthen which their self-denying labour brings upon them. If every scientific institution and every Naturalist's Field Club in the kingdom were to purchase a copy of this admirable volume for the use and instruction of their members, they would do much to render the production of such works more common, besides really furthering the progress of research, perhaps even more than by the publication in full of their own Proceedings.

This is undoubtedly the most important British work on Entomology since the completion of Mr. Stainton's "Natural History of the Tineina" thirteen years ago, and it is well worthy of the high reputation of its author; while the clearness of the type, the excellent systematic arrangement, the full indices, and the beautifully engraved figures, are equally commendable. Any detailed criticism on such a book could only be given by a worker in the same group; but as one who has often to refer to natural history volumes for information, the present writer would suggest that the absence of any *family* names as headings to the pages is a great inconvenience, as there is no means of ascertaining what group a genus belongs to or of finding the commencement or end of a family without constantly turning to the index. So far as the typography and general arrangement of the volume are concerned this is the only defect that has been noticed, and that it is so small a one may be taken as an indication of the care and attention which has been bestowed upon the publication, no less than on the composition of this notable volume.

A. R. W.

OUR BOOK SHELF

Ornithological Journal of the Winter of 1878-79; with Collected Notes regarding its Effects upon Animal Life, including Remarks on the Migration of Birds in the Autumn of 1878 and the Spring of 1879. By John A. Harvie-Brown, F.Z.S., M.B.O.U. (*Proc. Nat. Hist. Soc., Glasgow, 1879.*)

MR. HARVIE-BROWN, well known as one of the most active and practical of our home-ornithologists, has endeavoured to chronicle the abnormal effects of an

unusually severe winter on bird-life. To this end the scattered notices on this subject which have appeared in various journals and periodicals have been collected, and are supplemented by communications from private correspondents and by personal investigations. The result is the memoir now before us, in which the observations thus collected are arranged in a systematic form.

The southern migration in the autumn of 1878 was by all accounts unusually early and rapid. The outer Hebrides appear to have been almost cleared of their smaller birds. Visitors to Tyree in December remarked on the "extraordinary scarcity of common birds," and on the "unusual number of winter visitors." On the Solway Firth also "early notice of the coming winter was afforded by the arrival of vast numbers of wild fowl." Herr Gaetke of Heligoland reports that while in ordinary seasons the autumnal migration in that wonderful island often continues until the end of February, in the autumn of 1878 every migratory bird had sped past by the close of November.

Numerous other testimonies to these facts which are adduced by Mr. Harvie-Brown, leave no doubt as to the general effects produced on bird-life by the unusually severe winter of 1878-79, in which a January "colder than any for forty-one years" followed a December "the coldest of any for twenty-one years." The bulk of the memoir is taken up by a series of notes on the different species systematically arranged, a perusal of which is sufficient to show without doubt that the author's general conclusions are amply borne out by the particulars which he has collected.

On Mining and Mines in Japan. By C. Netto. (Tokio, 1879.)

THE substance of this pamphlet was given as a lecture by the author before the German Natural History and Ethnological Society of Eastern Asia, and it now appears with the above title as vol. ii. of the *Memoirs of the Science department of the University of Tokio*. It is mainly a discussion of the present state of mining and metallurgical industry in Japan, with suggestions for improvements by the introduction of machinery, the establishment of model dressing and reduction works, the formation of private companies, and more particularly the introduction of foreign capital, which is at present prohibited by the Japanese law. These points are treated in some detail, and the moderation with which the author expresses his conclusions shows a practical familiarity with the subject such as is likely to command the confidence of those persons who may be interested in the subject. It is however to be regretted that the author has not been fortunate enough to receive the co-operation of some of his literary colleagues in the production of the work in its present form, as the text, even by the greatest stretch of international courtesy, can scarcely be called English, and the directors of the University must certainly have been unaware of its character when they allowed it to appear among their Records. It is necessary to mention this, as an impression is to some extent current that the translation is of Japanese origin.

The Automatic Multiplier: for Performing Multiplication without Calculation and without Writing down any Figures except the Answer. By John Sawyer (London: George Bell, 1880.)

The Automatic Calculator, for cwt.s. qrs. lbs. at per lb., Supplying the Cost of any Weight at any Price up to 11s. 11½d. per lb. By the same.

IN NATURE, vol. xviii. p. 327, we noticed "Automatic Arithmetic" by the same author. We need only endorse the remarks we previously made with regard to the former work, and commend the present admirably compact and handy calculators to practical men who, after a little time spent in getting over the manual difficulty to beginners in

manipulating the vertical and horizontal slips, will find these works very serviceable as ready reckoners. Multiplication is reduced to a mere addition of digits: the earlier work facilitated the operation of division as well. We may add that the "Multiplier" is issued in three forms, *i.e.*, for multiplying 4 figures by 4 figures, 6 figures by 4 figures, and, as in the specimen we have, 8 figures by 6 figures.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The Freshwater Medusa

THE explanation of the discrepancy between Prof. Allman's and my own citation of my article in NATURE, vol. xxii. p. 147, appears to be that Prof. Allman has unfortunately received a copy of NATURE differing from the majority of the issue of that date in the fact that it was printed off before the final corrections, sent to the office of NATURE on Wednesday, had been inserted. These corrections were made before the greater number of the issue was struck off, and I have only just ascertained, to my great surprise, that any of the uncorrected copies had been circulated. The error as to the marginal canal was also present in the proof of my paper, marked "uncorrected proof, confidential," which was circulated among the Fellows at the meeting of the Royal Society on June 17, but the error was corrected by me before the reading of the paper.

Accordingly, so far as any publication or the public expression of my conclusions is concerned, I have not committed myself to the erroneous notion that the marginal canal is absent, although in the course of my inquiry I did entertain that and many other provisional conceptions as to the structure of *Limnocoelium*.

I shall be glad to see some explanation from the publishers of NATURE of the curious and highly inconvenient phenomenon of dualism in NATURE which has mystified both Prof. Allman and myself.

E. RAY LANKESTER

[Premising that we are supposed to leave NATURE in the printer's hands ready for press at 2 p.m. on Wednesday, we have no difficulty in giving the explanation asked for by Prof. Lankester.

His revised proof was received by us on Wednesday morning, June 16, with numerous corrections, which were given effect to. After the paper had been made over to the printer on the afternoon of that day a postcard was received by the printer with an additional correction, which was also duly made. On the morning of Thursday, the 17th, the following note, dated "Wednesday afternoon," was received by the printer after the printing of the American edition had been completed and that of the English one had commenced:—

"DEAR SIR,—If there is time please alter in my diagnosis—
'MARGINAL or RING CANAL obliterated or much reduced'
into 'MARGINAL or RING CANAL voluminous.'

"Similarly please alter
'RADIATING CANALS terminating coecally' into 'RADIATING CANALS opening into the marginal canal.'

"Truly yours,

"E. RAY LANKESTER"

Although one-third of the edition had been printed off, the printer, knowing our anxiety to give contributors every facility for corrections, stopped the press, and made the alterations which were asked for "if there is time." Possibly Prof. Lankester has no idea of what is involved in stopping a steam press. However this may be, the press was stopped in order to carry out to our utmost what we considered to be Prof. Lankester's wishes, and we are astonished that he can have put any other interpretation upon what happened. Prof. Lankester's letter given above is undated, but it was received on July 31 at mid-day. On the 28th he wrote, stating that he had found there were "two issues of NATURE of June 17," and requesting us to "state this if necessary." This does not